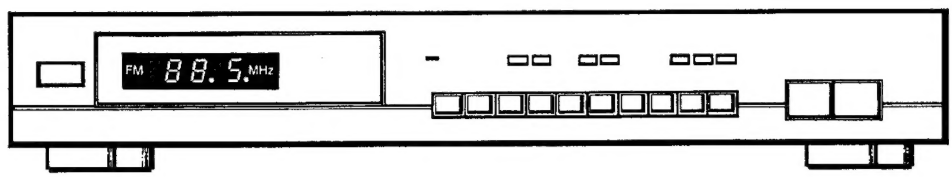
SERVICE MANUAL

UT-110

FM/AM DIGITAL TUNER



SPECIFICATIONS

FM Tuner Section

Frequency range·····87.5MHz to 108 MHz
Usable Sensitivity····· 11.2 dBf, IHF (1.0 μV/75Ω)
50 dB Quieting Sensitivity
·····Stereo : 43.29 dBf, IHF (40 μV/75Ω)
Signal - to - Noise Ratio····· Mono : 68 dB (at 80 dBf)
(DIN) Stereo : 58 dB (at 80 dBf)
Distortion (at 80 dBf)····· Stereo, 0.5% (1 kHz)
Alternate Channel Selectivity····· 90 dB (400 kHz)
Stereo Separation·····42 dB (1 kHz)
Frequency Response·····
+0.5～−2.5 dB(30 Hz to 15 kHz)
Image Response Ratio····· 85 dB
IF Response Ratio·····90 dB
AM Suppression Ratio·····60 dB
Antenna Input·····75Ω unbalanced

AM Tuner Section

Frequency range····· 522 kHz to 1629 kHz
Sensitivity (IHF, Loop antenna)····· 300μV/m
Selectivity····· 22 dB
Signal - to - Noise Ratio ····· 45 dB
Image Response Ratio····· 40 dB
IF Response Ratio·····50 dB
Antenna····· Loop Antenna

Audio Section

Output Level
FM (40 kHz DEV)····· 700 mV/3.6 kΩ
AM (30% MOD)·····180 mV/3.6 kΩ

Miscellaneous

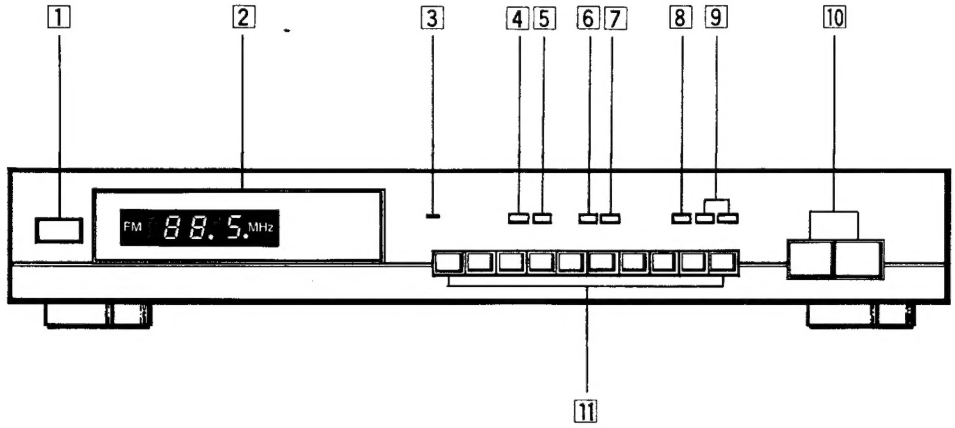
Power Requirements····· AC 230 Volts 50 Hz
Power Consumption·····9.5 W
Dimensions····· 435(W)×60(H)×250(D) mm
Weight (without package)·····3.15 kg

Furnished Parts

FM wire Antenna····· 1
AM Loop Antenna·····
Operating Instructions····· 1

NOTE :
Specifications and design subject to possible modification without notice due to improvements.

FRONT PANEL FEATURES



1. POWER SWITH
When this switch is set the on position, power is supplied to this tuner's main circuits.

2. DISPLAY INDICATOR
This shows the frequency of station currently being received in digit form.

3. TUNED INDICATOR
This lights up to indicate when firest tuning of a station has been achived.

4. PRESET SCAN BUTTON
If you press this button, the display scans only menorized preset stations for 5 seconds among 30 ramdom presets.

5. HI−BLEND BUTTON
HI−BLEND BUTTON bring on noise reduction effect at FM STEREO

6. FM MUTE BUTTON

7. MONO/STEREO BUTTON
This is used to FM stereo broadcast will be heard in mono, this button will not function for AM reception

8. MEMORY BUTTON
This is used to memorize station when the switch is depressed, the "MEMORY" indicator will light to memorized the frequency of any station, press the station call switch while the memory indicator is lighting up

9. BAND BUTTON
These are used to select the FM, AM broadcasting bands.

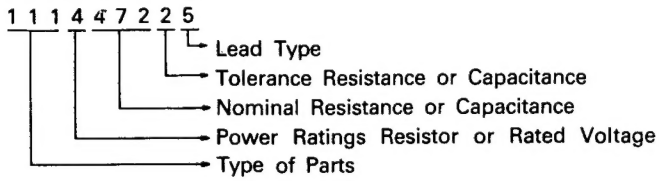
10. TUNIG BUTTON
This is used to locate the station. Push either side of this button : the left side "DOWN" to go to a low, and the right side "UP" to go to a higher frequency.

11. PRESET STATION BUTTON
These are used to preset and recall broadcasting stations

ELECTRICAL PART LIST

NOTE : When ordering parts first convert parts number into code form as shown in the following examples.

○ PARTS Numbering



○ RESISTOR

ex) Power Ratings Resistors

8 ··· 1/8W	4 ··· 1/4W	5 ··· 1/2W
1 ··· 1W	2 ··· 2W	7 ··· 4W

ex) Resistor Value

479 ··· 4.7 Ω	560 ··· 56 Ω	681 ··· 680 Ω
822 ··· 8.2KΩ	123 ··· 12KΩ	224 ··· 220KΩ

*CARBON film Resistor;1 [1][1] 437225(3.7KΩ ,1/4W)

○ CAPACITANCE

ex) Rated Voltage

3 ··· 16V	4 ··· 25V	5 ··· 35V
6 ··· 50V	7 ··· 63V	1 ··· 6.3V

ex) Type of Ceramic Capacitor

71 ··· CKDYB	75 ··· CKDYF	80 ··· CCDCH
88 ··· CCDSL	84 ··· CCDRH	86 ··· CCDTH

ex) Capacitor Value

040 ··· 4pF	470 ··· 47pF	221 ··· 220pF
182 ··· 1800pF	103 ··· 0.01 μF	473 ··· 0.047 μF

ex) Tolerance Capacitance

0 ··· C =± 0.25pF	1 ··· D =± 0.5pF	2 ··· F =± 1pF
3 ··· G =± 2%	4 ··· J =± 5%	5 ··· K =± 10%
9 ··· Z =+ 80 % − 20 %	6 ··· M =± 20%	

*ELECTROLYTIC CAP:1 [4][2] 647365(0.047 μF, 50V, ± 20%)
*CERAMIC CAP:1 [8][8] 647241(4700pF, 50V, ± 20%)
*MYLAR CAP:1 [5][0] 647251(4700pF,50V, ± 10%)
*STYROL CAP:1 [5][3] 643141(430pF, 50V, ± 5%)

REF.NO.	PART.NO	DESCRIPTION
• ICS		
IC1	244121771	KA7812
IC2	244143842	KA7806
IC201	244131872	LA1265
IC301	244135372	LA3401
IC401	244135272	LM7000
IC701	260012601	TMP47C 1270 V203
• TRANSISTORS AND FET		
Q101,102,103	240210125	KTC380 TM−0
Q201,301,302	240211135	KTC1815−GR
603,604		
Q402	240211815	KTC2240−GR
Q[illegible]303,403,405	240610815	KSR1001
601,702		
Q404,406,602	240610715	KSR2001
Q401	240411141	2SK 246Y
• DIODES		
D1−D7	241358165	IN4003L
D9	242122035	IN969B
D10	242108245	IN756A
D201,202	241508091	VARICAP SVC321
D301−303	241409995	IN4148
D401,402,601		
D602,701−709		
D711−718		
D901	241912131	LED KLR114ET
• COILS AND OTHERS		
T1	212974701	FM DET1
T2	212974801	FM DET2
T3	212712401	AM IFT
T4	212943501	AM OSC
T5	212710601	ANTENNA
L201	101122221	INDUCTOR 2.2MH
TC201, 202	212111701	CVCN0 6B200
F1, F3	213830601	SFE10.7 MS3G−HA
F2	213830501	SFE10.7 MA8−HA
F4	213831201	SFU 450−8
F5	213852101	FILTER ANTIBODY
F6	213831301	BFU 450−C4N
F301, 302	213851101	FILTER MPX
F0	213860901	BPMB6A 88−108MHz

REF.NO.	PART.NO	DESCRIPTION
X301	213835801	CSB456F11
X401	213810201	NSS−002−0
X701	213835901	CST4.19 MGW
FLT	214324101	8LT 06GK
VR201, 202	251222301	22K
VR301	251222401	220K
• SWITCHS AND OTHERS		
SW1	220225601	IKEY,G.S ALPS
SW700−716	220899901	KHH−10910, G.S ALPS
720, 721		
CABLE CARD	216831701	30P 150M/M
WA1A	216828901	30P ANG CONNECTOR
WA1	216830701	30P CONNECTOR
CN1	215858001	W−D0605#01 CONNECTOR
CN701	215857801	W−D0603#01 CONNECTOR
HOLDER FUSE	299911401	FPC 5000
HOLDER FLT	312051501	
HOLDER LED	373044102	ABS WHITE
TRANS POWER	213139801	DC20V AC4.8V
JACK 2P PIN	215560201	2P WHITE, RED
TERMINAL, ANT	215574201	75ohm PAL+AM
TERMINAL WRAPPING	215537701	NKC−007−B
HEAT SINK	371070102	30MM
SCREW	776440801	VBZ30P080FZK
FRONT END	212510701	TFFG3E140A, FM

REF.NO.	PART.NO	DESCRIPTION
• RESISTORS		
R10, 313	111410025	C.F, 10, 1/4W
R113,412,417	111410125	C.F, 100, 1/4W
418,512		
R205,206,222,315	111410325	C.F, 10K, 1/4W
403,404,411,413,414		
702−705		
707,708		
R212,213,218	111410425	C.F, 100K, 1/4W
R202,318,717,902	111412225	C.F, 1.2K, 1/4W
R201	111412325	C.F, 12K, 1/4W
R217	111418325	C.F, 18K, 1/4W
R1001	111415325	C.F, 15K, 1/4W
R320, 321	111415425	C.F, 150K, 1/4W
R105,110,220,409	111418225	C.F, 1.8K, 1/4W
R415	111422025	C.F, 22, 1/4W
R408	111422125	C.F, 220, 1/4W
R208, 210	111422225	C.F, 2.2K, 1/4W
R706, 1002	111422325	C.F, 22K, 1/4W
R304, 305	111427425	C.F, 270K, 1/4W
R407	111427125	C.F, 270, 1/4W
R103, 104	111427225	C.F, 2.7K, 1/4W
R203, 316	111427325	C.F, 27K, 1/4W
R102,107,108,112	111433125	C.F, 330, 1/4W
R207,306−309	111433225	C.F, 3.3K, 1/4W
602, 603		
R711	111433425	C.F, 330K, 1/4W
R101	111439125	C.F, 390, 1/4W
R410	111447125	C.F, 470, 1/4W
R109,219,406	111447225	C.F, 4.7K, 1/4W
R311,312,314,401	111447325	C.F, 47K, 1/4W
402,601,713−716		
R114,204,216,405	111456025	C.F, 56, 1/4W
R106	111456125	C.F, 560, 1/4W
R1, 2, 310	111456225	C.F, 5.6K, 1/4W
R211	111456325	C.F, 56K, 1/4W
R223	111468025	C.F, 68, 1/4W
R901	111468125	C.F, 680, 1/4W
R111	111475125	C.F, 750, 1/4W
R416	111482025	C.F, 82, 1/4W
R317	111482225	C.F, 8.2K, 1/4W
R302, 303	111415525	C.F, 1.5M 1/4W

REF.NO.	PART.NO	DESCRIPTION
• CAPACITORS		
C701	199113401	DB−5R5D 104
C203,210,313,314	141601065	CEA, 1 μF/50V
703		
C209,226,301,302	141310065	CEA, 10 μF/50V
305,309,310,311		
C11, 401	141210165	CEA, 100 μF/10V
C220,316,405,504	141310165	CEA, 100 μF/16V
C3, 7	141510165	CEA, 100 μF/35V
C4, 5	141710167	CEA, 100 μF/63V
C315	141622865	CEA, 0.22 μF/50V
C221	141622965	CEA, 2.2 μF/50V
C214	141322065	CEA, 22 μF/16V
C1	142510267	CEA, 1000 μF/35
C206,318,319	141633965	CEA, 3.3 μF/50V
C2	141322165	CEA, 220 μF/16V
C407, 411	141647865	CEA, 0.47 μF/50V
C207, 601	141647965	CEA, 4.7 μF/50V
C106,204,217,413	141347065	CEA, 47 μF/16V
C8, 9	141447065	CEA, 47 μF/25V
C312	141668865	CEA, 0.68 μF/50V
C103,216,225,412	175610395	CKDYF, 0.01 μF, Z
C227	188610145	CCASL, 0.0001μF, J
C306	171622245	CKDYB, 0.0022μF, J
C101,104,205,208	175622345	CKDYF, 0.022 μF, Z
213,218,219,224		
317,402,414		
C403,404	180627045	CCDCH, 27PF, J
C100	180620045	CCDCH, 20PF, J
C303	188633145	CCDSL, 330PF, J
C102,105,201,202	175647395	CKDYF, 0.047 μF, Z
211, 304		
C212, 406	150647345	CQMA, 0.047 μF, J
C307, 308	188633145	CCDSL, 330PF, J
C215	153647141	CQSA, 470PF, J
• OTHERS		
CODE AC	221110902	NDG−009−0, VDE
AM ANTENNA	221335302	AM LOOP ANT
FM ANTENNA	221310201	FM WIRE ANT
PIN CORD	215821601	NDE−016−0
FUSE	299821701	T80MA/250V

ADJUSTMENT

FM tuner section

- Connect the FM signal generator (FM SG) to the FM Antenna 75 ohm terminal through a75 ohm dummy antenna.
- Set the UT−110 to the FM Band,
  1) Tune the FM SG to the UT-110
  2) Connect the FM Multiplex stereo signal generator to the FM SG external Modulation terminal. Set the modulation to Main 1KHz/L+R/± 40kHz deviation, pliot 19kHz/6kHz deviation.

Step	FM SG 1kHz, 40kHz deviation		Tuner Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		87.5 MHz		Confirm that 1.9V DC± 0.5V between termianl VT and Ground.
2	No signal		108.0 MHz		Confirm that 8.0V DC± 0.5V between termianl VT and Ground.
3	98.0 MHz	60 dB	98.0 MHz	T1	Adjust until T−meter at between T and T could be positioned at center
				T2	Adjust until Distortion at output L or R terminal is minimum.
4	98 MHz set to stereo	60 dB	98.0 MHz	I.F (within± 90)	Adjust until Distortion at ouptut L or R terminal is minimum.
5	98 MHz	14± 6 dB	98.0 MHz	VR202	Adjust until indicator light up.
6	98 MHz set to stereo		98.0 MHz	VR301	Adjust until stereo separation at output L or R terminal is maximum.

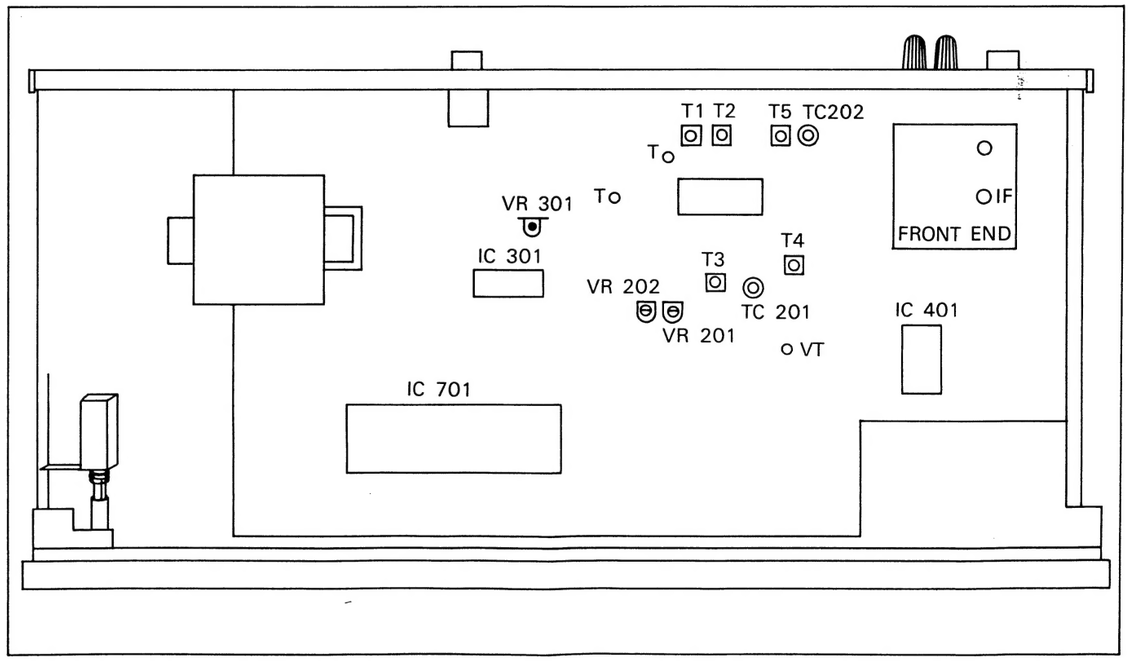
4) The tuned indicator should go off within 20 KHz to 40 KHz when moving away (in either direction) from a tuned frequency.

AM Tuner

- Connect the furnised AM Loop antenna between terminais AM ANTENNA and GND.
- Connect the AM signal generator (AM SG) to the AM Antenna terminal.

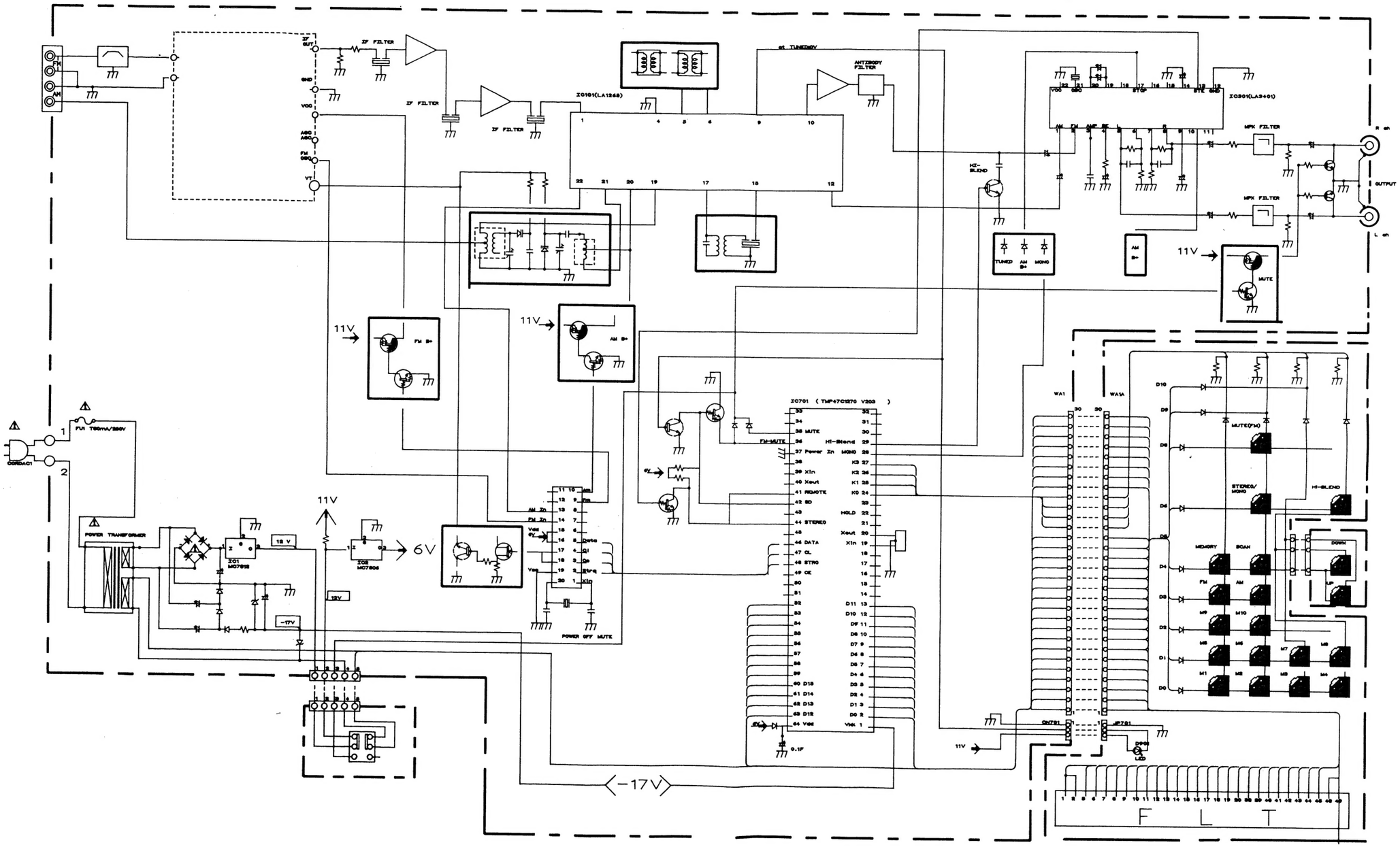
*3) Tune the AM SG to the UT−110

Step	AM SG 400 kHz, 30% modulation		Tuner Frequency Display	Adjustment Point	Adjustment Procedure
	Frequency	Level			
1	No signal		522 kHz	T4	0.95V DC between terminal VT and GND.
2	No signal		1629 kHz	TC201	7.4V DC between terminal VT and GND.
3	Repeat steps 1 and 2 until both specification are corret				
4	594 kHz (*3)	60 dB	594 kHz	T5	Adjust until maximum sensitivity in attained
5	1395 kHz (*3)	60 dB	1395 kHz	TC202	
6	999 kHz (*3)	60 dB	999 kHz	T3	
7	999 kHz	52 dB	999 kHz	VR201	Adjust until Tuning indicator light up.

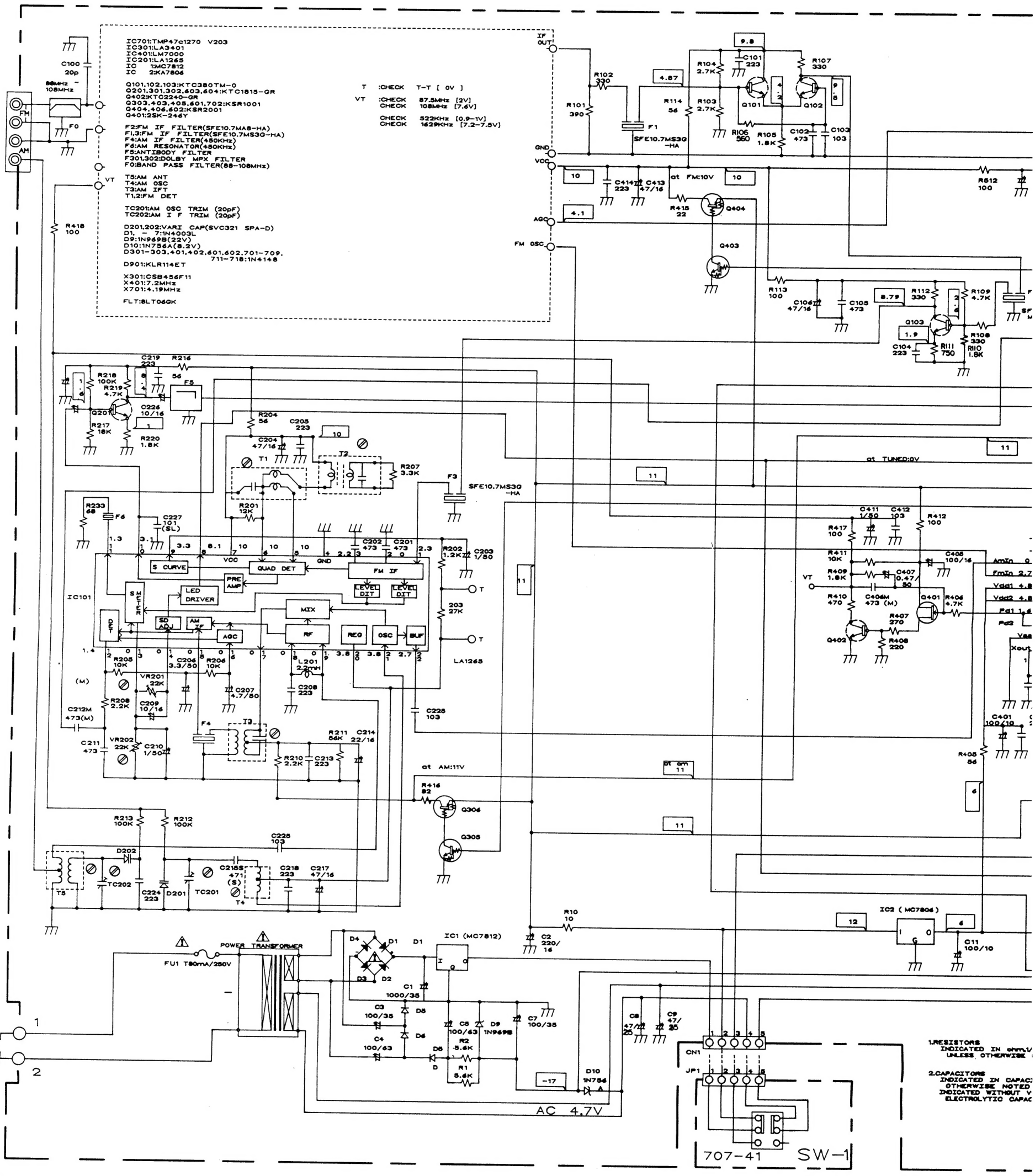


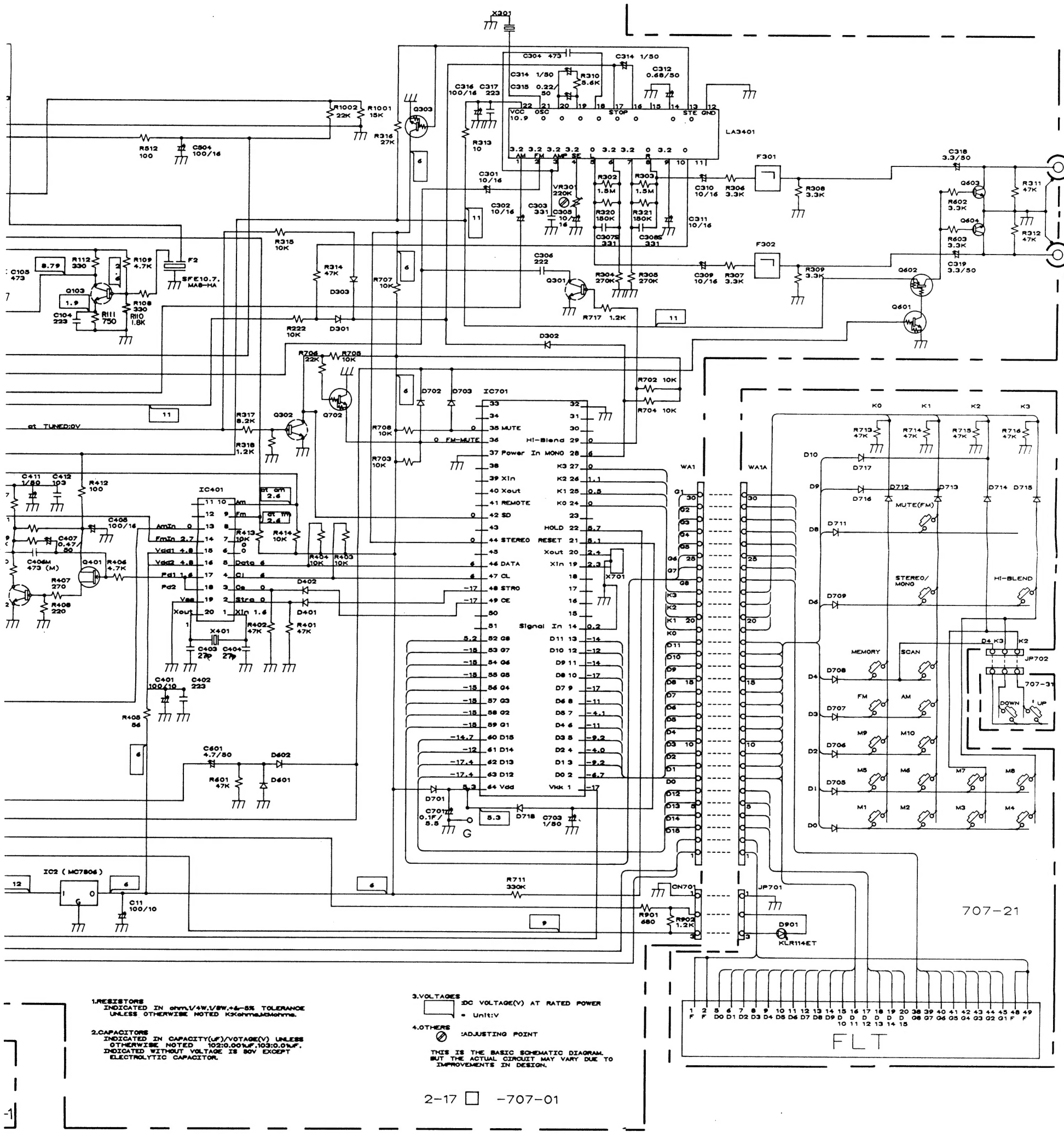
–Adjustment points–

BLOCK DIAGRAM



SCHEMATIC DIAGRAM





1.RESISTORS
INDICATED IN ohm,1/4W,1/8W,+&-5% TOLERANCE UNLESS OTHERWISE NOTED K3Kohms,M3Mohms.

2.CAPACITORS
INDICATED IN CAPACITY(uF)/VOTAGE(V) UNLESS OTHERWISE NOTED 102:0.001uF,103:0.01uF. INDICATED WITHOUT VOLTAGE IS 50V EXCEPT ELECTROLYTIC CAPACITOR.

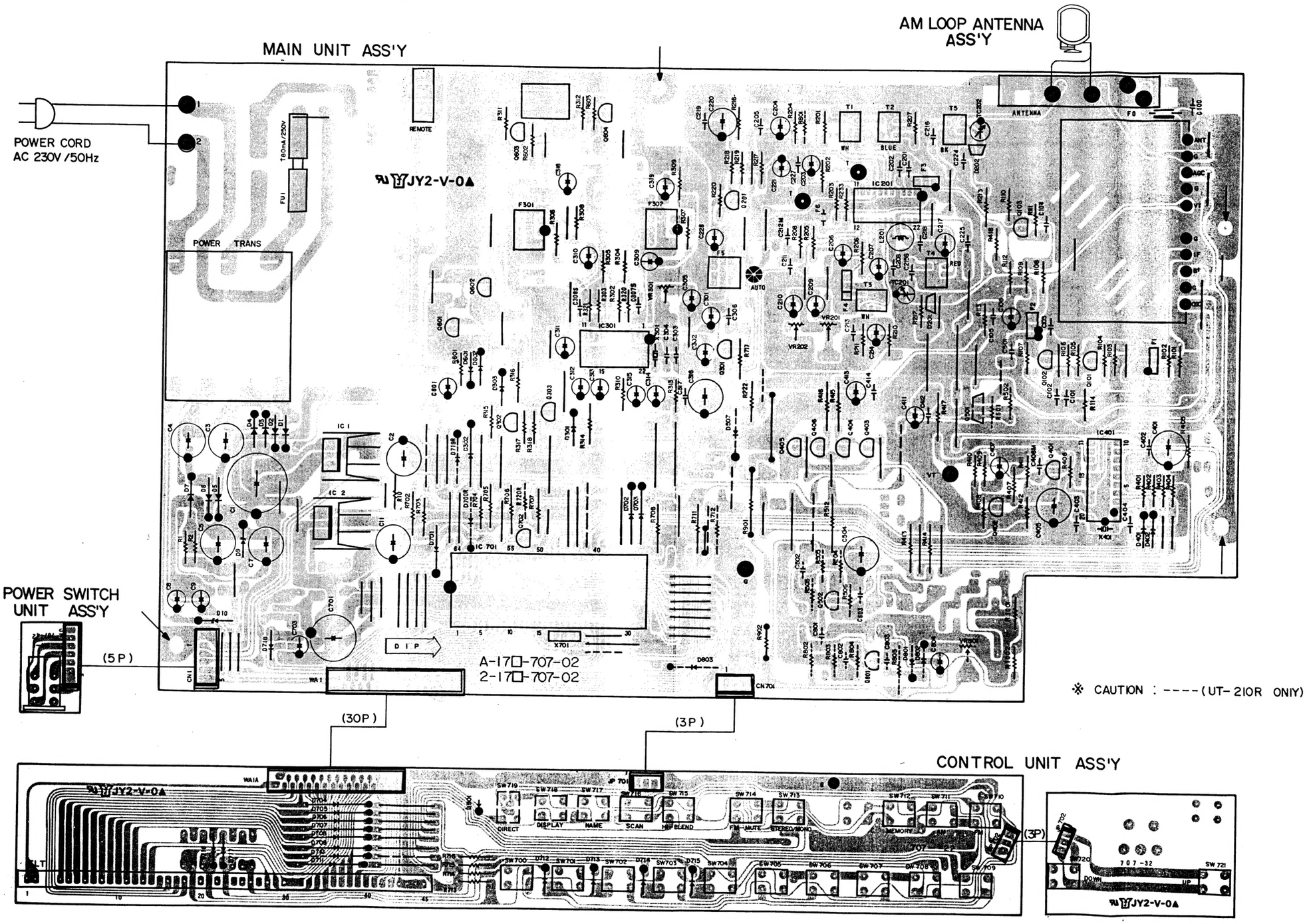
3.VOLTAGES
DC VOLTAGE(V) AT RATED POWER
= Unit:V

4.OTHERS
:ADJUSTING POINT

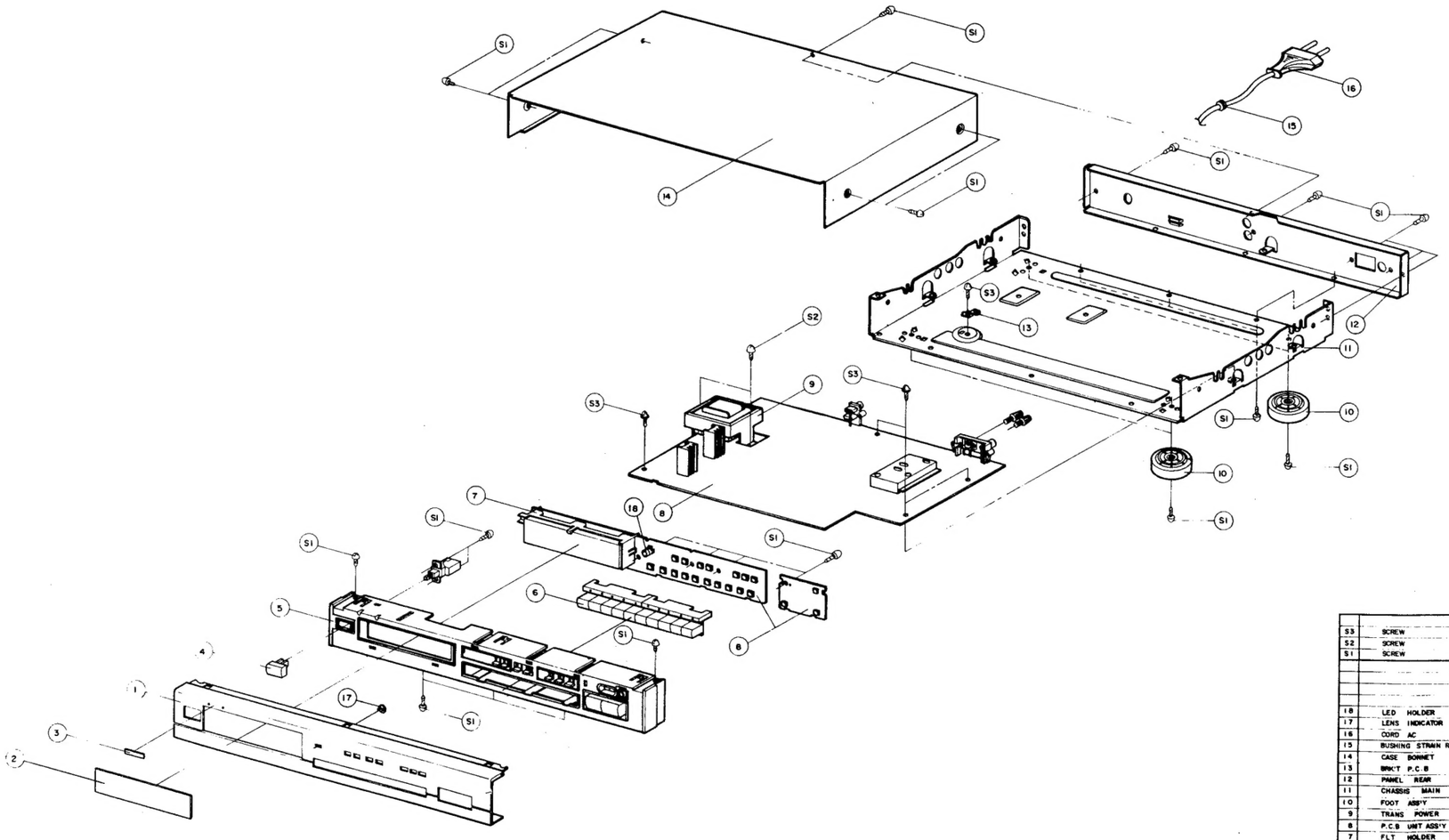
THIS IS THE BASIC SCHEMATIC DIAGRAM. BUT THE ACTUAL CIRCUIT MAY VARY DUE TO IMPROVEMENTS IN DESIGN.

2-17 □ -707-01

WIRING DIAGRAM

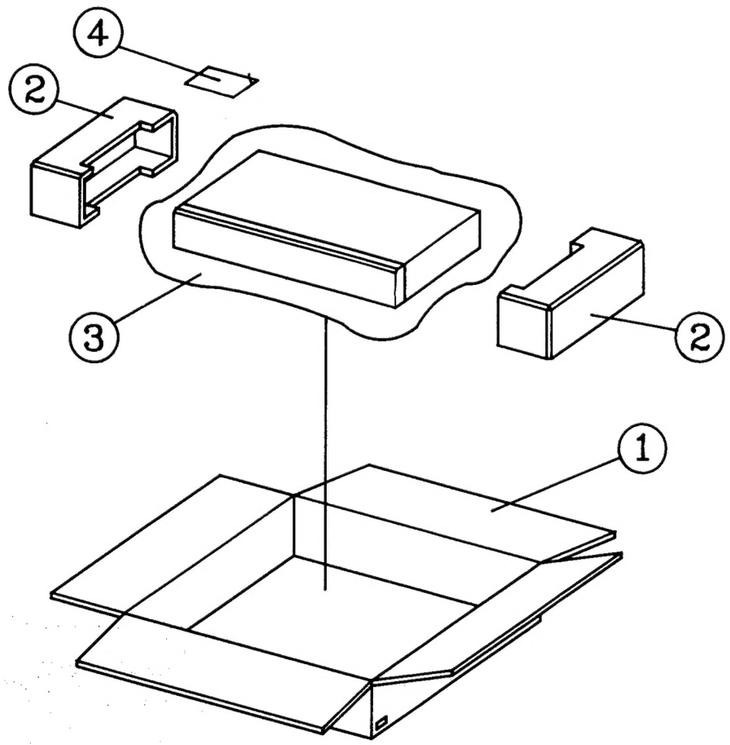


EXPLODED VIEW



NO.	PARTS NAME	PARTS NO.	MATERIAL	QTY
S3	SCREW	7-344-408-02	ATZ30P080FMC	4
S2	SCREW	7-768-406-02	VBZ40P060FMC	2
S1	SCREW	7-764-406-01	VBZ30P080FZK	28
18	LED HOLDER	3-730-441-02	ABS	1
17	LENS INDICATOR	3-110-918-02	PMMA	1
16	CORD AC	2-211-109-02		1
15	BUSHING STRAIN R	8-201-115-01	HEYCO, SR.4N-6	1
14	CASE BONNET	3-217-008-01	SECC 0.6T+PVC SHEET 0.2T	1
13	BRKT P.C.B	3-216-008-01	SECC-1 F8 (20/20) 1.0T	1
12	PANEL REAR	3-217-103-01	SECC-1 F8 (20/20) 0.8T	1
11	CHASSIS MAIN	3-217-006-01	SECC-1 F8 (20/20) 1.0T	1
10	FOOT ASS'Y	3-120-621-01	HIPS+TPR (SILVER)	4
9	TRANS POWER	2-131-398-01		1
8	P.C.B UNIT ASS'Y	A-170-712-01		1
7	FLT HOLDER	3-120-515-01	ABS	1
6	KNOB STATION	3-217-004-01	ABS	2
5	PANEL BASE	3-217-202-01	ABS	1
4	KNOB POWER	3-214-504-01	ABS	1
3	BADGE	3-120-622-01	A1070-P	1
2	WINDOW FRONT	3-217-005-01	ACRYL 3T	1
1	PANEL FRONT	3-217-201-01	A-6063-T5	1

PACKING DRAWING



NO	PARTS NUMBER	DESCRIPTION	Q'TY
1	3-217-009-01	PACKING CASE	1
2	3-214-515-02	SIDE PAD	2
3	3-110-639-01	POLY SHEET	1
4	3-217-010-01	OPERATING MANUAL	1
5			
6			